Instructional Plan

Teacher	School	Subject/Course	Grade	Class Length
Steven English	Shaw Middle School	Science	8th	53 minutes

Topic/Lesson Title
Force and Motion-Cars and Ramps:
What influences the speed of the car – weight or ramp position?

DESIRED RESULTS

Content Standards/GLEs/District Curriculum Expectations

Washington State GLEs

- Science 1.2.1 Analyze how parts of a system interconnect and influence one another.
- Science 1.1.4 Understand energy is a property of matter, objects, and systems and comes in many forms.
- Science 1.2.2 Understand how various factors affect energy and that energy can be transformed from one form to another.
- Science 1.3.1 Understand factors that affect strength and direction of forces.
- Science 1.3.2 Understand how balanced and unbalanced forces can change the motion of objects.
- Science 2.1.2 Understand how to plan and conduct scientific investigations.
- Science 2.1.3 Apply understanding of how to construct a scientific explanation using evidence and inferential logic.

Learning Targets/Lesson Objectives

- I can identify the parts of a system.
- I can identify the variables and behaviors in a system.
- I can identify the types of energy in a system.
- I can analyze a system and determine the energy transformations that occur.
- I can conduct a fair and accurate inquiry investigation.

BACKGROUND INFORMATION

Resources Used To Develop Lesson

- Cars and ramp apparatus
- Motion detectors

Interdisciplinary Connections

- Math–Constructing and plotting coordinate pairs on a graph

Assessment Of Prior Learning

- Conduct a formal open inquiry of the pendulum to see how they ”do science”
- Entry tasks that call upon students to identify variables, analyze data tables, and write a hypothesis and procedures

Materials/Equipment/Tools

- Cars and ramps system

FORMATIVE AND SUMMATIVE ASSESSMENT

Formative Assessment	Summative Assessment
• Use colored cards to communicate levels of understanding • Identify variables in an investigative question • Write a hypothesis • Construct a data table • Write a procedure with variables identified • Construct a graph	Formal lab report will be presented including: • hypothesis • materials list • step by step procedure • graph • variables identified • data table constructed • written conclusion (This is a three day process.)

LESSON PLAN

Lesson Overview

1. Complete prior day's lab.
2. Work in small groups on new lab.
3. Teacher monitors student progress.
4. Clean up.
5. Class shares what was learned during lab.

Teacher Tasks	Student Tasks
1. Entry Task: Introduce the new lab with a reading about Galileo. 2. Have students finish the entry task for the prior day's lab. 3. Provide necessary components for new lab. 4. Monitor to answer and ask clarifying questions. 5. Facilitate class discussion.	1. Finish the entry task for the prior day's lab. 2. Begin new lab to determine the relationship between the weight of a car and its rate of acceleration. 3. Clean up. 4. Share what was learned during lab.

LESSON REFLECTIONS

Biggest blunder—forgot to check in with kids and realized they had not finished their "system" analysis and I gave them the structural handout for the inquiry. I adjusted by checking with each table and had them back on track.

The debrief of the entry task proved to be an excellent dialogue regarding the variables in an investigation. I uncovered the misconception as I "stamped" the entry task and decided it was worthwhile to debrief the entry task and have a discussion about "variables."

Use of cards for quick formative assessment always a good idea, yet need to remember it is a "cursory" or "shallow" assessment without the dialogue. Needed more time to debrief student learning regarding their day in the lab. I would have stopped earlier and had them write down a learning they had and had a share out.

In looking at quality instruction, look for the piece that was not specifically addressed, classroom community. Watch to see how I consistently tried to manage myself throughout the lesson even when I knew I forgot where I started, Galileo's "quote" or story and anything that appeared unexpected. My goal is to keep the community "vibrant" for early adolescents. Look at humor, how I share "power" and model how this is a room where we can all spend time, learn together, and be very OK with what we share with one another.